

operating instructions

CYLINDER POWER ANALYZER

This analyzer is designed to pinpoint a particular cylinder which is not contributing to overall engine performance. As an additional feature, you can adjust carburetor balance and measures voltage and resistance for total ignition system testing.

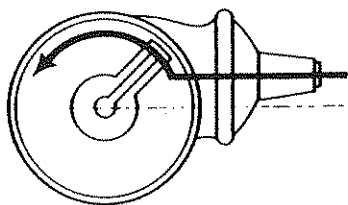
Cylinder Power Balance

In performing the power balance test, an individual cylinder power check is made. As each cylinder is dropped out of the firing order, the RPM should show a decrease. If little or no RPM decrease occurs, either an electrical or mechanical (valves, rings, spark plug wire, spark plug, rotor, etc.) problem is indicated.

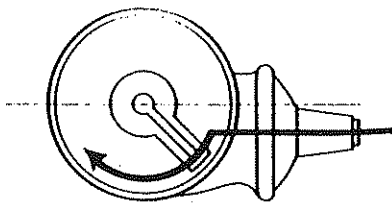
NOTE: On certain late model vehicles the EGR valve must be disconnected before the power balance test can be performed properly. Remove the vacuum hose from the EGR valve and plug the hose for the duration of the power balance tests. In order to perform the power balance test, you must first determine the engine's firing order. Usually, the firing order will be located in a visible area on the engine block, or on a label on the vehicle or in the vehicles owners manual.

If unable to determine the firing order by this method, the following method using the distributor rotor rotation and tracing the spark plug wires will indicate the firing order.

Rotor rotation can be determined by visualizing a line passing through the vacuum line and across the cap as illustrated. If the vacuum chamber unit is positioned above the center line of the distributor, the rotor rotation is counterclockwise. If the vacuum chamber is below the center line, the rotation is clockwise.



COUNTERCLOCKWISE

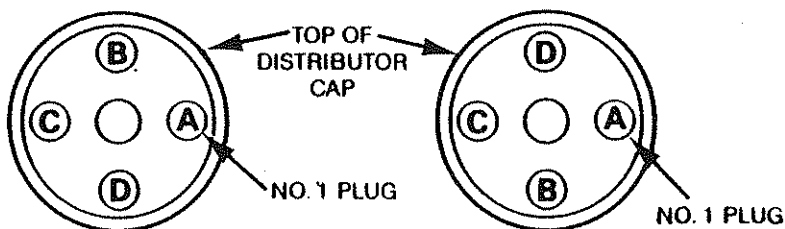


CLOCKWISE

Location of Number One Cylinder

The number one cylinder for inline engines will be the cylinder closest to the fan or the front of the engine. For V-type engines, note which valve cover is closest to the fan or front of the engine, this will be the number one cylinder.

Location of the remaining cylinders in the firing order can be determined by tracing the spark plug wires from the distributor cap to each cylinder in order, either counterclockwise or clockwise.

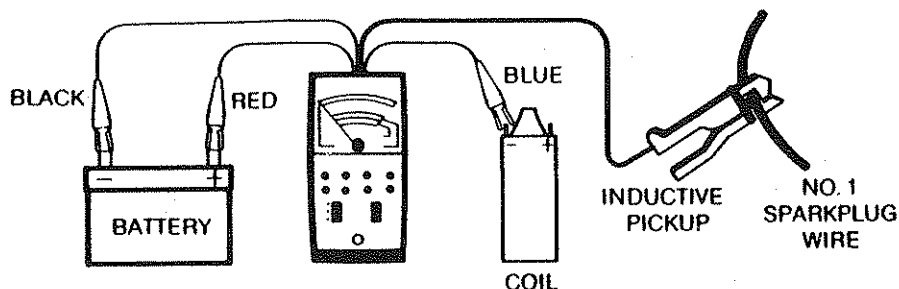


To convert this firing order to the cylinder selector push buttons on your analyzer, the 'A' button will always be the first cylinder in the firing order, the 'B' button will be the second in the firing order, the 'C' button the third in the firing order, etc.

EXAMPLE

8 cylinder	Firing Order	1 8 4 3 6 5 7 2
	Selector Push Buttons	A B C D E F G H
6 cylinder	Firing Order	1 5 3 6 2 4
	Selector Push Buttons	A B C D E F
4 cylinder	Firing Order	1 4 3 2
	Selector Push Buttons	A B C D

1. Place 'Tests' switch in 'Power Test' position.
2. Place 'Cylinders' switch in appropriate position.
3. Connect Black clip to Battery Negative.
4. Connect Red clip to Battery Positive.
5. Connect Blue clip to Coil Negative terminal.
6. Place inductive pickup over number one spark plug with arrow pointing towards the spark plug.



7. Start the engine and run at approximately 900 RPM.
8. Using the cylinder selector push buttons, push each button in order as required. A through H and note the RPM decrease as each cylinder is taken out of the firing order.

The amount of decrease for each cylinder should be approximately the same if the engine is performing properly.

If one or more cylinders has very little decrease compared to the remaining cylinders, a problem is indicated as mentioned under Cylinder Power Balance, and should be corrected.

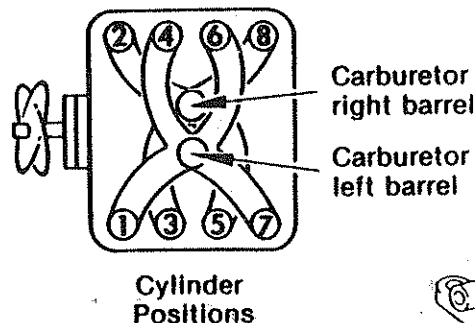
CARBURETOR BALANCE TEST

(V and opposed-type engines only)

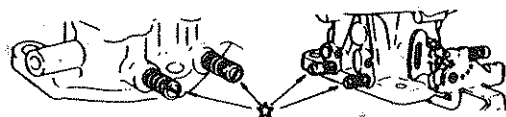
If a problem cylinder is discovered in performing the POWER BALANCE test, the problem must be corrected before the CARBURETOR BALANCE test can be tested properly.

The purpose of the carburetor balance test is to learn if the carburetor adjustment for the right and left barrels are equally adjusted.

The illustrations below show a typical V-8 Intake manifold layout, the position of the right and left carburetor barrel openings and also the carburetor mixture screws.



TYPICAL IDLE MIXTURE ADJUSTMENT SCREW



The tester is connected for this test the same way it is connected for the CYLINDER POWER test. (It is important that the #1 pick-up is connected to the #1 spark plug.)

EXAMPLE: The firing order is 1 8 4 3 6 5 7 2 .

To check one side of the carburetor mixture setting you will want to cut out the cylinders connected to the carburetor left barrel. To do this, simply press every other button, starting with button A and hold these buttons down just long enough to see what the RPM is with the four cylinders cut out. (NOTE: DON'T HOLD THE BUTTONS DOWN OVER 10 SECONDS AT ANY TIME.)

To check the other carburetor adjustment - start with button B and hold down every other button starting with button B. See what the RPM reading is - the two RPM readings should be basically the same.

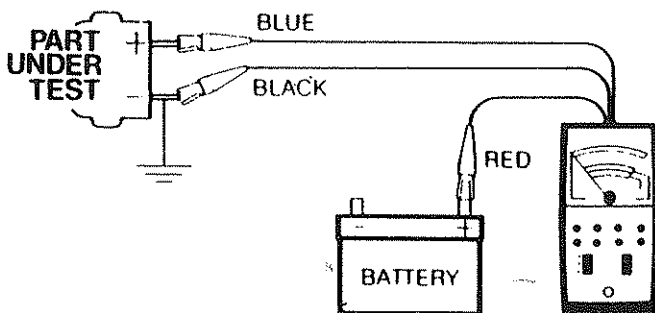
You will notice the following cylinders are connected to the carburetor left barrel adjustment 1 - 4 - 6 - 7 or A - C - E - G. The cylinders connected to the right barrel adjustment are 8 - 3 - 5 - 2 or B - D - F - H .

In this manner, the operating efficiency of one barrel can be compared to that of the other barrel. This test is also used in confirming test results of the POWER BALANCE test, and detecting vacuum leaks, bad manifold gaskets, and poor carburetor adjustment.

Voltage Tests

1. Connect the Black lead to the Negative side of the voltage to be measured.
2. Connect the Blue lead to the Positive side.
3. Read Voltage on the volts scale on the meter.

Use the voltmeter to check the charging/starting system, electrical harness, etc.

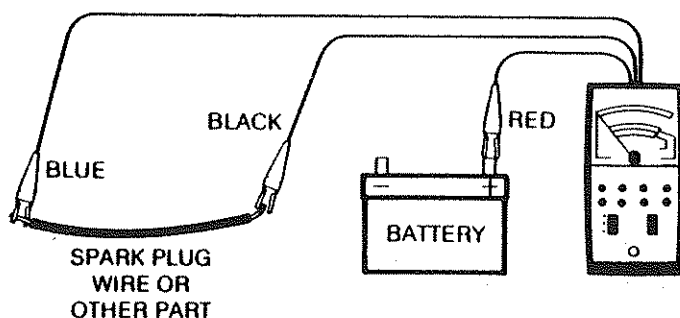


Ohms Tests

Use the Black and Blue clips for resistance tests.

1. Hook the Black and Blue clips together and adjust the 'Ohms Zero' knob until the meter pointer indicates zero.
2. Use the Blue and Black clips on each end of the component being tested (spark plug wire, etc.) and read resistance on the ohms scale.

EXAMPLE: A reading of 10 on the ohms scale equals 10,000 ohms (10k).



NOTE: The Red clip is not required for volts and ohms testing, but it can remain hooked up to the battery positive post to prevent the clip from coming in contact with a moving part of the engine or making an accidental electrical contact.

WARNING

Important Operating & Safety Notes . . . READ BEFORE PROCEEDING WITH TESTS.

1. **ALWAYS** work in a well ventilated area . . . **NEVER** start a vehicle's engine in an enclosed area.
2. **NEVER** smoke or allow any other open flame to come within 25 feet of vehicle being tested.
3. **ALWAYS** insure that **EVERYONE** within close proximity of the vehicle being tested is **CORRECTLY** wearing **APPROVED** safety/protective glasses before proceeding with any testing or adjustment.
4. **ALWAYS** insure that vehicle being tested is in Park or Neutral and Emergency Brake is engaged.
5. **ALWAYS** insure that the tester's black grounding clip is connected **FIRST** during hook-ups, and that it is disconnected **LAST** when testing is completed.
6. **ALWAYS** exercise **EXTREME** caution to insure that hands, arms, clothing, and tester leads are kept well away from **ALL** moving engine parts.

Due to the inherent dangers associated with even the simplest automotive maintenance procedures, the manufacturer and all parties involved in the distribution and/or sale of this automotive test product will **NOT** be held liable or responsible, wholly **OR** partially, for **ANY** injuries, damages or claims resulting from the performance of testing or adjustment procedures included in this instruction guide and/or the use of this automotive test product.

IMPORTANT NOTICE

THIS INSTRUMENT DESIGNED TO BE USED ON VEHICLES WITH 12 VOLT ELECTRICAL SYSTEMS AND RESISTIVE IGNITION WIRE ONLY. (Carbon core).

THE TESTING PROCEDURES AND INFORMATION IN THE MANUAL IS INTENDED AS A GENERAL GUIDE FOR ENGINE TUNE UP AND ADJUSTMENTS ONLY. ALWAYS CONSULT THE VEHICLE MANUFACTURERS SERVICE MANUAL FOR SPECIFIC PROCEDURES. DO NOT ATTEMPT TO SERVICE YOUR VEHICLE WITHOUT FOLLOWING THE VEHICLE MANUFACTURERS INSTRUCTIONS AND SPECIFICATIONS.

MAKING TESTS:

Make proper hookups and select proper switch positions as indicated in each test. Proceed with testing. Maintaining your automobile in proper working order is the first requirement for performance, safety and economy. You can do it yourself by following the simple testing procedures outlined in these instructions. You must refer to the vehicle manufacturers manual or another reliable source for the proper tuneup specifications and repair procedures for the vehicle you are working on.

Should you ever need to have your tester serviced, please contact the following:

Kal Equip Company
10011 Walford Avenue
Cleveland, Ohio 44102-4696
(216) 651-2233

Please include the complete name and model number of your tester.